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GEOCHEMICAL SURVEYS

LARGO MINES LTD. (N. P. L.)

NORTH PIMAINUS AREA

HIGHLAND VALLEY AREA, KAMLOOPS M.D., B.C.

92I/6E APRIL 1970

Ex Claims
50°26½'-27'
121°12'-14'
no deposit

Latitude 50°27'
Longitude 121°21'

REPORT BY: L.W. Saleken, B.Sc.
Geologist

Geotronics Surveys

517 - 602 West Hastings Street, Vancouver, British Columbia, Canada ✱ Telephone 688-4342

page

GEOCHEMICAL SOIL SAMPLE SURVEY CONDUCTED ON
PIMAINUS CREEK NORTHERN MAP AREA FOR
LARGO MINES LTD. (N.P.L.)

SUMMARY:

The North Pimainus claims are located about eight miles north-east of Spences Bridge, British Columbia in the Kamloops Mining Division. A total of 39 fractional and full sized mineral claims constitute the group. The claims are owned by Largo Mines Ltd. (N.P.L.), Vancouver, B.C.

A grid soil sample survey along cut and marked lines was conducted by Geotronics Surveys Ltd., Vancouver, B.C. between February and April 1970. A total of 1,009 soil samples were collected and analyzed for copper by hot HCI methods. The results were interpreted using graphic and statistical methods. A soil geochemical map contoured at 50 ppm intervals was constructed and accompanies this report.

Several anomalous zones occur along the western margin of the claims. Significant anomalies are located on claims Pat 33, 42, 43, and DS 19, 29, 30.

INTRODUCTION:

The report is a discussion of the survey procedure and results of a geochemical soil survey conducted on the North Pimainus claims for Largo Mines Ltd. (N.P.L.), Vancouver, B.C. The survey was conducted by Geotronics Surveys Ltd. field crews

between February and April 1970. The duration of the field time was influenced by weather and access conditions.

The analysis, conclusions and recommendations of this report are based on the writer's experience and field work in the general vicinity of Pimainus Creek.

LOCATION AND ACCESS:

Approximate co-ordinates: Latitude: 50 degrees 27' 26½

Longitude: 121 degrees 12'

The North Pimainus claims are located on the southwestern fringe of the Highland Valley mining camp, Kamloops Mining Division, B.C. The claims are situated along Pimainus Creek with the bulk of the claims occurring north and northeast of the creek. The group is approximately eight miles northeast of the community of Spences Bridge.

Access to the claims is the dirt road along the north side of Pimainus Creek. The turnoff is situated two miles east of Spences Bridge along the east side of the Thompson River. The claims are located about 12 miles along the road.

PROPERTY:

The North Pimainus claims consist of 39 fractional and full sized mineral claims. The approximate location of the claims appears on the soil geochemistry map. These claims are:

Claim Name:	Recording Number:	Recording Date:
DS 11 - 26 & 29 - 36	77402-77417 & 77426-77433	March 10, 1969
Pat 9	77367	March 10, 1969
Pat 11	77369	March 10, 1969
Pat 13	77371	March 10, 1969
Pat 15	77373	March 10, 1969
Pat 17	77375	March 10, 1969
Pat 19	77377	March 10, 1969
Pat 31	77379	March 10, 1969
Pat 33	77381	March 10, 1969
Pat 35	77383	March 10, 1969
Pat 37	77385	March 10, 1969
Pat 40 - 43 incl.	77388 - 77391	March 10, 1969

PHYSIOGRAPHY:

The North Pimainus claims lie in the southern portion of the Thompson Plateau along the Pimainus Creek drainage. The local relief on the group is moderate to extreme with a maximum relief of 1,500 vertical feet. The hillside to the north of the creek slopes to the south and southwest.

The climate is generally of the dry belt type, influenced by elevations and the Coast Range Mountains. Average precipitation is greater than 10 inches per year. Temperatures vary with seasons with minimum winter conditions reaching 40 below zero.

Pine, fir and other conifers along with scrub brush inhabit the creek bottom and hillsides.

HISTORY OF PROPERTY:

The North Pimainus claims were staked in February - March of 1969. The claims are south of the old Toketic deposit which

consists of fracture fillings of specular hematite with minor chalcopyrite as reported by Cockfield.

The claims are presently held by Largo Mines Ltd. (N.P.L.), Vancouver, B.C.

GENERAL GEOLOGY:

As indicated on the geological map (S. Duffell and K.C. McTaggart), the south Pimainus area is largely underlain by Jurassic Guichon Creek batholith rocks. The contact between the Guichon and Spences Bridge Group appears to occur along Pimainus Creek. K.E. Northcote has mapped the Guichon rocks as Hybrid phase granodiorite and quartz diorite.

The Hybrid phase forms the periphery of the batholith. The rocks range in composition from hornblendite through diorite to quartz diorite and granodiorite, although most of the rocks are quartz diorite. Petrographically, the rocks are equigranular, commonly foliate, consisting of quartz, plagioclase, orthoclase, biotite, augite and minor hypersthene. Sulphides occurring are pyrite, chalcopyrite, some bornite and molybdenite. The Hybrid phase is cut by dykes and irregular bodies of other phases and is the oldest intrusive rock of the batholith (Northcote, 1969).

Structural features within the Hybrid phase include foliation, joints, shearing and fault zones.

Mineralization occurring in the batholith is associated with zones of weakness.

Spences Bridge Group, Upper Cretaceous, of lavas, pyroclastic rocks and minor sediments occur to the south of Pimainus Creek. The group is unconformable with the Guichon Creek batholith.

A mantle of transported glacial drift covers the claim area.

GEOCHEMICAL ENVIRONMENT OF PROPERTY:

The North Pimainus claim area is covered by a mantle of transported drift and slump of varying thickness. The exposed outcrop on the claims is about 10 percent and consists of Guichon Creek batholith rocks.

The soil is a transported glacial drift and slump having a moderate to poorly developed eluvial horizon. The B horizon is located from 6 to 14 inches below the surface and ranges in colour from brown-red to yellow-red. An organic layer approximately 2 to 4 inches thich constitutes the surface horizon. The soil is moderately drained. According to the taxonomic system of soil classification, the soil is of the order of brunisohic to podzolic.

FIELD WORK AND PROCEDURE:

Field work on the North Pimainus claims was conducted between November 1969 to April 1970 and consisted of line cutting and soil sampling. The work was spread over six months and was

governed by weather and field conditions.

The lines were cut on a north-south, east-west grid having a 500 foot line spacing. The lines were blazed, flagged and stations marked at 100 foot intervals on a standard grid.

Soil samples were collected on 100 foot centers along the lines and placed in standard sized heavy duty kraft envelopes. A total of 1,009 samples were taken by a mattock from the B horizon and analyzed for Cu ppm by hot acid HCl extraction methods at a commercial laboratory.

METHOD OF GEOCHEMICAL ANALYSIS:

The samples were dried at the base camp prior to shipping to a commercial laboratory (T.S.L. Laboratories Ltd., Vancouver, B.C.) for analysis.

The samples at the laboratory were screened to minus 80 mesh and a one gram sample was digested in hot HCl acid from which standard acid solutions were prepared. Separate aliquots of sample solution were analyzed for copper.

Copper was determined by atomic absorption spectrophotometry. The atomic absorption unit consists of three major components, a hollow cathode lamp, a burner-atomizer, and a monochromator. The test solution is aspirated directly into the burner atomizer and the respective transmittancy is read directly on a scale expansion unit on the monochromator. The copper content of the

sample is calculated by comparing it's transmittancy with a standard curve.

INTERPRETATION OF GEOCHEMICAL RESULTS:

The interpretation of geochemical results was done by a simplified statistical treatment of data by graphical methods. The method is patterned after Claude Lepeltier's paper "A Simplified Statistical Treatment of Geochemical Data by Graphic Representation."

The results were plotted on a histogram (fig. 1) and found to be lognormally distributed. From there, the data was transferred to log probability graph paper and plotted using the cumulative frequency of classes (fig. 2). The background and threshold values were read directly from figure 2, as being 36 ppm and 55 ppm respectively.

The soil sample results appear on the accompanying 1 inch to 500 feet soil geochemistry map. Contouring is from threshold (55 ppm) using 50 ppm intervals.

Values above threshold are considered anomalous.

CONCLUSIONS & RECOMMENDATIONS

1. The background and threshold values for the claims is 36 ppm Cu and 55 ppm Cu respectively.
2. Anomalous values occur on claims: Pat 42, Pat 43, Pat 33, and D.S. 19, 29, 30.
3. High anomalous values such as 670 ppm Cu and 432 ppm Cu are interesting but may reflect contamination from float material from the Toketic deposit.
4. Magnetometer and electromagmetic surveys are recommended for the anomalies occurring on claims Pat 33, 42, 43, and D.S. 19, 29,30.
5. Reconnaissance geological mapping along the grid is strongly suggested.

Respectfully submitted,

L.W. Saleken

L.W. Saleken, B.Sc.
Geologist.

BIBLIOGRAPHY:

1. Barakso, J.J., Rowles, C.A. and Lavkulich, L.M., 1969, Geochemical Prospecting in B.C., Western Miner, June 1969, pp. 22 - 32

2. Carr, J.M., 1966, Geology of the Bethlehem and Craigmont Deposits, Tectonic History and Mineral Deposits of the the Western Cordillera, C.I.M.M., Special Vol. No. 8, pp. 321 - 328

3. Cockfield, W.E., 1948, Geology and Mineral Deposits of the Nicola Map Area, British Columbia, G.S.C. Mem. 249

4. Duffell, S. and K.D. McTaggart, 1951, Ashcroft Map - Area, British Columbia, G.S.C. Mem. 262

5. Hawkes, H.E. and Webb, J.S., 1962, Geochemistry in Mineral Exploration, Harper's Geoscience Series, New York

6. Lepeltier, Claude, 1969, A Simplified Statistical Treatment of Geochemical Data by Graphical Representation, Ec. Geol. Vol. 64, pp. 538 - 550

7. Northcote, K.E., 1969, Geology and Geochronology of the Guichon Creek Batholith, B.C.D.M. Bull. 56

8. Report on the Sixth Meeting of the National Soil Survey Committee of Canada, Laval University, Quebec, 1965.

9. Tennant, C.B. and White, M.L., 1959, Studey of the Distribution of Some Geochemical Data, Ec. Geol. Vol. 54, pp. 1281 - 1290

Geotronics Surveys

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RESUME OF LEONARD WILLIAM SALEKEN, B. Sc.

EDUCATION

Graduate of the University of British Columbia, Faculty of Science, Geology, B. Sc.

Member of the Canadian Institute of Mining and Metallurgy (C.I.M.M.) and the Geological Association of Canada (G.A.C.)

TECHNICAL AND FIELD EXPERIENCE

Summers of 1964, 1965, 1966: engineering aide, Materials Testing Branch, B. C. Dept. of Highways in engineering geology, soils investigation and analysis, gravel exploration, hydrological field testing, surveying; drill crew supervision.

Summer, 1967: assistant geologist, Duval Corporation in general prospecting for base metals using geochemical and geological methods; geological mapping and property evaluation.

May 1968 - October 1969: exploration geologist, Denison Mines Ltd., Vancouver, B. C. in uranium prospecting, geological mapping and interpretation, report writing, geochemical surveys, radiometric surveys (ground and airborne), office management, personnel hiring and public relations. Field specialization: sedimentary uranium. Particular interests: Tertiary Stratigraphy and Volcanism.

October, 1969: Consultant, Geotronics Surveys Ltd., Vancouver, B. C.

L. W. Saleken

L. W. SALEKEN, B. Sc.
Consultant Geologist

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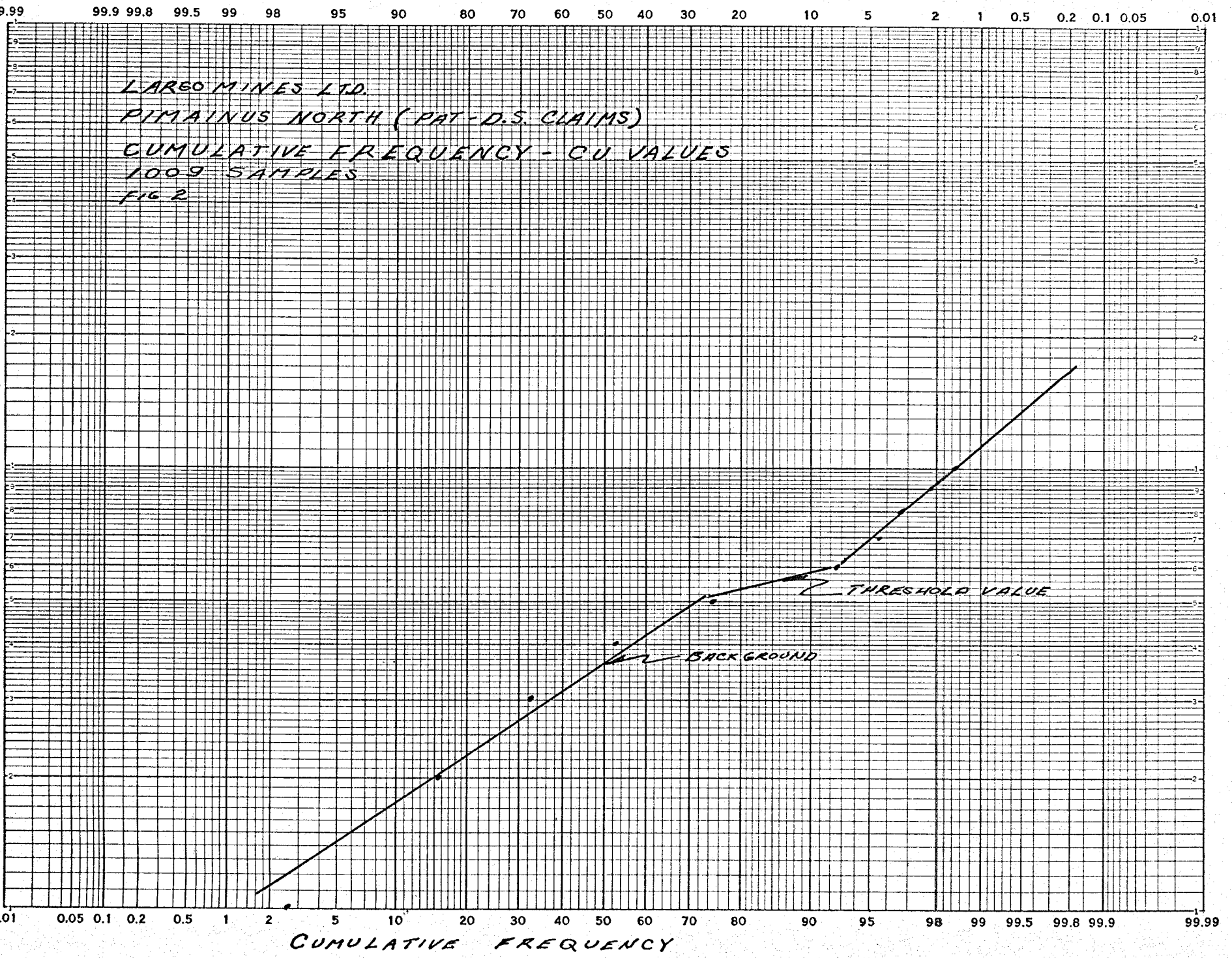
FIG. 4

CALCULATION CHART:

CLASS	TOTAL SAMPLES	% DISTRIBUTION	CUMULATIVE FREQUENCY
1 - 9	58	5.3	100.0
10 - 19	112	10.0	94.7
20 - 29	181	17.0	84.7
30 - 39	220	20.0	67.7
40 - 49	254	23.3	47.7
50 - 59	109	17.0	24.4
60 - 69	27	2.7	7.4
70 - 79	15	1.4	4.7
80 - 89	11	1.1	3.3
90 - 99	7	.7	2.2
100 - 109	2	.2	1.5
110 - 119	3	.3	1.3
120 - 129	1	.1	1.0
130 - 139	0	.0	
140 - 149	1	.1	.9
150 - 159	2	.2	.8
160 - 169	3	.3	.6
231	1	.1	.3
452	1	.1	.2
670	1	.1	
20	1,009	100	



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LARGO MINES LTD.

PIMAINUS NORTH (PAT - D.S. CLAIMS)

HISTOGRAM OF SOIL SAMPLES

HOT HCL EXTRACTION

1009 SAMPLES

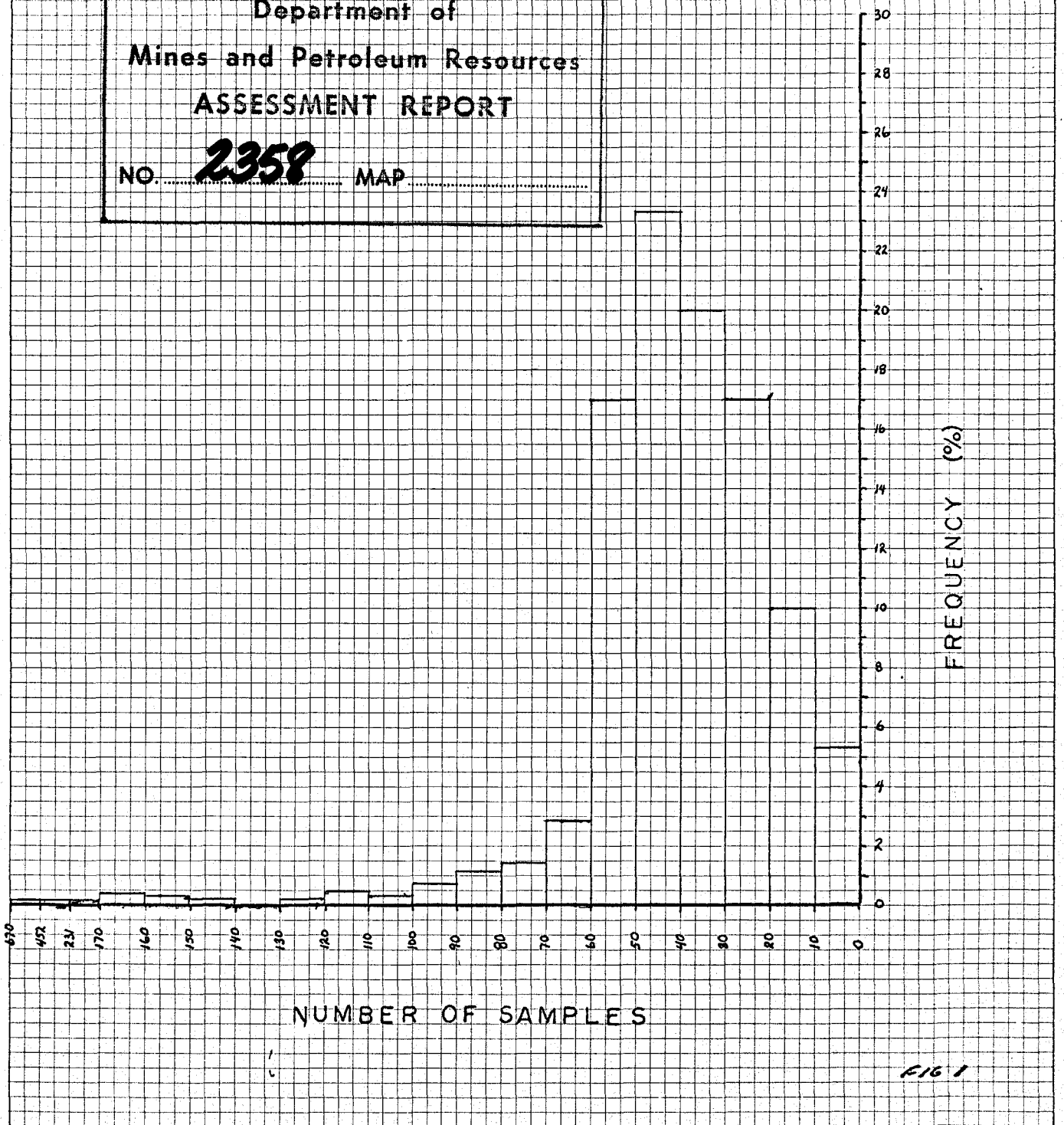

FIG 1

E. P. SHEPPARD & ASSOCIATES LTD.
CONSULTING GEOLOGISTS
314-402 WEST PENDER STREET,
VANCOUVER 3, B.C.

April 28, 1970.

Mr. Tom Rolston,
Geotronics Surveys,
517-602 W. Hasting Street,
Vancouver, B.C.

Dear Mr. Rolston:

At your request I have reviewed the references Listed below and examined the report prepared by employees of your company, "Geochemical Report, Largo Mines Ltd. (N.P.L.), Cowbird and Pat claims, North Pimainus Area, Highland Valley Area, Kamloops Mining Division, B.C.

The 39 claims group is located about eight miles northeast of Spences Bridge, B.C. Latitude 50°27'N, Longitude 121°21'W. A dirt road located on the north side of Pimainus Creek provides access to the claims. This road turns off the highway 2 miles east of Spences Bridge. The claims are located about 12 miles along the road.

Geology: From a study of the geological maps referred in the report, it appears that the claims are underlain by Jurassic Guichon Creek batholith rocks and Spences Bridge Group rocks. The contact between Guichon and Spences Bridge group lies along Pimai-- nus Creek. The Guichon rocks are mapped as Hybrid phase granodiorite and quartz diorite and form the periphyry of the batholith. They Hybrid phase is cut by dikes and irregular bodies of other phases and is the oldest intrusive rock of the batholith. Structural features within the Hybrid phase include foliation, jointing, fracturing, shearing and faulting. Sulfide Mineralization consists of Pyrite and Chalcopyrite with minor amounts of Bornite and Molybdenite and is usually associated with zones of weakness. The claims are covered with glacial drift for the most part, with about 10% of the area showing exposed bed rock.

Geochemical Survey: Anomalous geochemical values occur on claims Pat. 42, 43, 33, and D.S. 19, 29, 30. The anomalies appear to trend northwesterly across the claims or nearly parallel with

.....cont.

Pimainus Creek. It is felt that the Geochemical anomalies alone do not constitute sufficient information on which to carry out a diamond drill program.

It is recommended that:

1. Geological mapping be carried out on the claims.

2. Magnetometer and Electromagnetic Surveys be carried out over the anomalous areas outlined by the Geochemical Survey.

The results of these surveys will determine whether further exploration in the form of diamond drilling is necessary.

The Geochemical report, accompanied by suitable maps submitted by your company shows careful preparation. I am satisfied that the field work performed was of the same high caliber as that carried out on assignments where your crews were under my direct supervision.

Respectfully submitted,

E. Percy Sheppard, P. Eng.
Consulting Geologist.

EPS:lg

References

1. Barakso, J.J., Rowles, C.A. and Lavkulich, L.M., 1969, Geochemical Prospecting in B.C., Western Miner, June 1969, pp. 22 - 32.
2. Carr, J.M., 1966 Geology of the Bethlehem and Craigmont Deposits, Tectonic History and Mineral Deposits of the Western Cordillera, C.I.M.M., Special Vol. No. 8, pp.321-328.
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4. Duffell, S. and K.D. McTaggart, 1951, Ashcroft Map - Area, British Columbai, G.S.C. Mem. 262.
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6. Lepeltier, Claude, 1969, A Simplified Statistical Treatment of Geochemical Data by Graphical Representation, Ec. Geol. Vo. 64, pp. 538 - 550.

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7. Northcote, K.E., 1969, Geology and Geochronology of the Guichon Creek Batholith, B.C.D.M. Bull. 56.
8. Report on the Sixth Meeting of the National Soil Survey Committee of Canada, Laval University, Quebec, 1965.
9. Tennant, C.B. and White, M.L., 1959, Study of the Distribution of Some Geochemical Data, Ec. Geol. Vol. 54, pp.1281 - 1290.

COST BREAKDOWN:

1,009 soil samples @ $3.50 collection and analysis	$ 3,531.50
Geologist mapping, reports and printing	500.00
Survey materials	95.00
Four wheel drive vehicle rental, one month	450.00
Camp maintenance, food, etc., 2 man crew, 20 days @ $30.00	600.00
Engineering fees	300.00
	$ 5,476.50

Personnel, March 20 to April 10, 1970:

R. Simpson, crew chief
J. Dodd, field assistant
K. Colombo, field supervisor

Personnel wages included in soil sample collection costs.

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 30 day of April 1970, A.D.

Linda Delaurier

Joan Turner
Sub-mining Recorder

D.S. 2

COW BIRD 1-6

D.S.1

D.S.3

D.S.4

T. S. M.

D.S.5

D.S.6

GROUP

D.S.7

BAR GROUP

D.S.9

L-40

L-35

L-30

L-25

L-20

L-15

L-10

L-5

L-0

N

PAT 40-43

L-42S

L-47S

L-52S

D.S. CLAIMS 11-36

B.L.2.

30E

45E

60E

75E

L-57S

L-62S

L-67S

L-72S

L-77S

L-82S

L-87S

L-92S

L-97S

L-102S

L-107S

L-112S

L-117S

PAT I-36

PIMAINUS CREEK

BASE LINE

45W

30W

15W

0

15E

30E

45E

60E

75E

LEGEND

- Located Claim Posts
- Unlocated Claim Posts
- 5 Cu. Value p.p.m.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2358 MAP #1

NOTE:

Treshold 55ppm Cu
Contour interval 50 ppm

2358

To accompany Report prepared by :-
L.A. Saleken, B.Sc., Geologist.

LARGO MINES LTD. (N.P.L.)

PIMAINUS CREEK, D.S., COW BIRD,
& PAT CLAIMS - KAMLOOPS - M. D.

GEOCHEMICAL SOIL SAMPLE VALUES
type of survey
HOT HCl EXTRACTION Cu: p.p.m.

scale	date	job no.	sheet no.	drawn by
1" = 500'	Mar. 1970	69-45	3	A.B.O.

Geotronics Surveys Ltd.
337 - 890 West Hastings Street, Vancouver, British Columbia

E.P. SHEPPARD
PROFESSIONAL ENGINEER
BRITISH COLUMBIA